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EMPIRICAL PAPER

Adapting a blended motivational interviewing and problem-solving intervention to address risky substance use amongst South Africans

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Abstract

The purpose of this study was to examine the acceptability and initial substance use outcomes of a blended motivational interviewing (MI) and problem-solving therapy (PST) intervention, delivered by peer counsellors. Twenty people who scored at risk for substance use according to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) received a five session blended MI-PST intervention and were assessed at baseline and at three months. An open-ended semi-structured interview, designed to identify possible factors that may hinder or promote the acceptability of the intervention was also conducted. Fifteen participants completed the intervention and the three-month follow-up. According to ASSIST scores, participants significantly reduced their substance use ($p > 0.001$) at the three-month follow-up. Randomized controlled trials are needed to evaluate the effect of this intervention more rigorously.

Keywords: motivational interviewing; problem-solving therapy; emergency departments; South Africa; task shifting

Introduction

Problem-solving therapy (PST) is a brief cognitive-behavioural intervention designed to improve problem-solving skills and coping. Evidence suggests that PST is effective for treating common mental disorders (Cuijpers, van Straten, & Warmerdam, 2007) in a broad range of cultural settings. A meta-analysis of 31 studies found that PST leads to significant reductions in mental illness symptoms and is more effective in reducing mental health problems than treatment as usual or attention-control interventions (Malouff, Thorsteinsson, & Schutte, 2007).

Although most of these 31 studies were conducted in high-income countries, several recent studies conducted in low- and middle-income countries (LMIC) provide emerging evidence that PST may be effective for reducing psychological distress (van't Hof, Stein, Marks, Tomlinson, & Cuijpers, 2011) and treating depression and anxiety (Chibanda et al., 2011) in these settings. Although these mental disorders often co-occur alongside substance use-related problems and while cognitive-behavioural therapy (CBT) is a well-established modality for addressing substance-related problems, very few studies have examined the efficacy of PST for

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addressing substance-related problems (D’Zurilla & Nezu, 2006).

There are a number of reasons for exploring whether PST is a suitable intervention for substance-related problems. First, research has revealed an association between maladaptive problem-solving and substance use. According to D’Zurilla, Nezu, and Maydeu-Olivares’ (2002) model of social problem-solving, individuals can be classified according to their problem orientation (either positive or negative) and by their dominant problem-solving style; with the three most common problem-solving styles being a rational approach to problems, an impulsive-careless style, or problem avoidance. Maladaptive problem-solving exists when individuals have a negative problem orientation and an impulsive-careless or avoidant style of problem-solving. There is evidence that problem-solving deficits are related to substance use among adolescents (Jaffee & D’Zurilla, 2009) and college students (Elliot, Johnson, & Jackson, 1997; Williams & Kleinmeyer, 1989), alcohol dependence among adults (Nixon, Tivis, & Parsons, 1992), heroin dependence among adults (Platt, Scura, & Hannon, 1973), and substance use among adults (Sorsdahl, Stein, Carrara, & Myers, 2013). Since there is evidence that problem-solving deficits respond to PST (D’Zurilla & Nezu, 1999), it is possible that PST is an appropriate intervention for substance-related problems.

Second, the delivery of PST can be task-shifted from speciality health professionals to non-speciality staff in health services. This is particularly important for LMICs where there are often shortages of health professionals which impact on the availability and coverage of substance abuse services (Kakuma et al., 2011). This is also the case in South Africa. Currently, the South African substance abuse treatment system focuses primarily on the treatment of dependence through the delivery of drug “rehabilitation” services offered by specialist, stand-alone substance abuse service providers (Myers, Louw, & Pasche, 2010). However, feasibility studies on integrating screening and brief interventions (SBIs) into primary healthcare services (specifically emergency departments) have resulted in positive findings (Myers, Stein, Mtukushe, & Sorsdahl, 2012; Sorsdahl et al., 2013). Screening for substance use identifies whether patients’ use places them and others at risk and hence warrants a brief intervention. Furthermore, recent studies have consistently shown that lay counsellors or non-speciality health personnel (e.g., community health workers) can be trained to effectively deliver brief psychosocial interventions (Patel, Chowdhary, Rahman, & Verdeli, 2011), including PST for mental disorders (Chibanda et al., 2011). The advantage of using PST within a

task-shifting approach is that, PST follows clearly defined steps that are simple to teach to non-professional staff and easy to manualize; decreasing the risk of intervention drift and facilitating fidelity to the intervention.

Third, PST can be integrated with other evidence-based interventions for substance-related problems to enhance outcomes. There is some evidence that integrating motivational interviewing (MI) with CBT enhances intrinsic motivation for behavioural change (Moyers & Houck, 2011) and increases the likelihood of a positive response to the cognitive-behavioural components of the intervention. There is also some evidence that PST may also help reduce substance abuse (D’Zurilla & Nezu, 2006). In addition, such integrated interventions may also address some of the shortcomings associated with MI. Although many studies have found that brief MI interventions to address substance use in primary care facilities have positive outcomes in the short-term (Kaner et al., 2009; Moyer, Finney, Swearingen, & Vergun, 2002; Vasilaki, Hosier, & Cox, 2006), these findings have not been replicated in a South African setting (Peltzer et al., 2013; Pengpid, Peltzer, Skaal, & Van der Heever, 2013), possibly due to the difficulties in training non-speciality staff to conduct MI. Further, where these positive effects have been found, the magnitude of these effects diminishes over time (Havard, Shakeshaft, & Sanson-Fisher, 2008; Nilsen et al., 2008). This is probably because MI does not directly address the cognitive-behavioural factors that often lead to continued substance use or relapse to substance use, such as poor problem-solving ability (D’Zurilla et al., 2002).

Finally, given the high levels of mental health comorbidity in South Africa, particularly among substance-using populations (Stein et al., 2008) and as unaddressed depression could lead to poor responses to interventions for substances, it would be useful to identify a transdiagnostic intervention that addresses both substance use and depression. There is presently considerable research on the effectiveness of PST for the treatment of depression (Cuijpers et al., 2007).

A blended MI-PST intervention may be more effective for addressing substance-related problems than PST alone; to the best of our knowledge there have been no studies examining the effectiveness of a blended MI-PST intervention for reducing substance use. This paper begins to address this gap by reporting findings from an uncontrolled pilot study that aimed to assess the acceptability and initial substance use outcomes of a blended MI-PST intervention for patients presenting to emergency room settings in Cape Town, South Africa.

Methods

Participants and Recruitment Procedure

Twenty participants were recruited from one of three 24-hr emergency departments in the Cape Town area. More specifically, peer counsellors approached patients as they waited to receive care and introduced the intervention programme by providing general details of the programme and potential benefits of participating.

To be eligible to participate in the pilot, participants had to be at least 18 years of age, and screen at moderate or high risk for substance-related problems using the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST: WHO ASSIST Working Group, 2002). Eligible participants were asked to provide informed consent to participate in a substance use risk reduction programme. An interviewer-administered baseline questionnaire, that took approximately 45 min to complete, was then administered to those patients who provided consent. Following completion of the baseline questionnaire,

participants received the first of five intervention sessions (see Figure 1).

Intervention Adaptation and Description

The MI-PST intervention was adapted from an intervention previously tested among South Africans experiencing psychological distress in disadvantaged communities (van't Hof et al., 2011). The original intervention was designed as a self-help programme for American and European populations (Bowman, Scogin, & Lyrene, 1995). However, when this self-help intervention was piloted in South Africa there were high drop-out rates for participants, who went through the intervention on their own despite including "coaching sessions" for those in need (van't Hof et al., 2011). Therefore, we decided to adapt this intervention by adding an initial MI session that focused on building problem recognition of substance-related problems and readiness for behaviour change and reformulating the intervention materials so that they could be delivered in an individual-format by a peer counsellor.

Summary of blended MI and PST sessions and objectives	
At baseline 30 min	<ul style="list-style-type: none"> · Conduct screening/assessment of alcohol use · Provide feedback on results of screening/assessment · Increase knowledge of how alcohol use impacts on physical and mental health · Use MI to build rapport and develop readiness to change <ul style="list-style-type: none"> o Assess readiness to change (using readiness ruler) o Assess pros and cons of change (decision-balance exercise) o Use MI to try and shift participant and elicit a commitment to change
Session 1 60 min	<ul style="list-style-type: none"> · Patient check-in (using MI) (5 min) · Build the rationale for PST (15 min): <ul style="list-style-type: none"> · Explain the structure of PST · Explain the link between problems and alcohol use, and the rationale for PST · Establish positive problem orientation · Describe the steps of PST · Build the rationale for activity scheduling · Describe the steps of problem solving (15 min) · First problem-solving session with counsellor (using the steps) and describe homework (25 min)
Session 2 40 min	<ul style="list-style-type: none"> · Patient check-in (using MI) (5 min) · Review homework from previous week and challenges/difficulties (5 min) o Elicit positive change talk and affirm commitment to change using MI techniques o Review PST steps and affirm attempts to change · Explain what can be done about problems that are not important (coping with negative thoughts) (10 min) · Second-problem solving session with counsellor and an exercise (25 min)
Session 3 40 min	<ul style="list-style-type: none"> · Review practice exercises from session 3 (5 min) · Explain what can be done about problems that are important but cannot be solved (5 min) · Third-problem solving session with counsellor and an exercise (30 min)
Session 4 40 min	<ul style="list-style-type: none"> · Review practice exercises from session 3 (5 min) · Fourth-problem solving session with counsellor and an exercise (30 min) · Use MI to affirm progress to date and discuss way forward and follow-up (5 min)

Figure 1. Blended motivational interviewing (MI) and problem solving therapy (PST) intervention (outline).

The first session was about 30 min in duration and occurred directly after completion of the screening interview. This session consisted of a peer counsellor-delivered ASSIST-linked brief MI intervention (World Health Organization, 2008), designed to enhance the participant's intrinsic motivation for change (World Health Organization, 2008). After completing the first sessions, participants returned to the community health centre, where the emergency room was located for four PST follow-up sessions approximately one week apart. These sessions did not focus on substance use specifically, but took the form of D'Zurilla and Nezu's (2006) approach to dealing with everyday life problematic situations. These remaining four sessions focused on developing and practicing problem-solving skills to address life problems, such as relationship or employment issues. The core content covered by each of these sessions and session duration is outlined in Figure 1. During these sessions the peer counsellor and the participant worked through a PST booklet, collaboratively identifying what problems were occurring in the participant's life, and then focusing on exploring one or more of these problems while the counsellor taught the participant a structured approach for resolving these problems. This booklet also contained homework exercises for each of the four sessions. Homework is a key component of PST since it provides the opportunity for participants to practice the skills they acquire during their sessions with the counsellor. The homework assignments were clearly defined by the counsellor and the booklet provided a useful framework for tracking progress.

Counsellor Training and Supervision

The five counsellors who conducted the brief intervention had a bachelors-level education or equivalent experience and originated from the communities served by the selected emergency services. These peer counsellors received 18 hrs of training in MI (with proficiency testing through role-playing and case examples) provided by a MI-certified trainer and also received three half-day booster trainings to limit intervention drift and ensure that the MI skills were being applied appropriately. These peer counsellors also completed 12 hrs (1.5 days) of a training programme in PST (with proficiency testing through role-playing and case examples). In addition to the intervention training, peer counsellors received training in (i) alcohol and illicit drugs and the risks associated with substance use, (ii) using and scoring the ASSIST, (iii) ethics of research and importance of maintaining confidentiality and reporting adverse events, (iv) the intervention protocol, and (v) the process of referring patients for specialized care.

To ensure intervention fidelity, peer counsellors participated in biweekly supervision and debriefing sessions conducted by a clinical social worker in which cases were reviewed. In addition, intervention sessions were audiotaped and 50% of those were reviewed by the principal investigator and used for corrective feedback.

Schedule of Research Assessments

Research assessments were conducted at baseline and the baseline questionnaire was re-administered three months subsequent to the last PST session. In addition, an open-ended semi-structured interview, designed to identify possible factors that may hinder or promote the acceptability of providing a peer-counsellor delivered PST intervention for substance use for patients attending emergency services, was conducted at the follow-up assessment. All interviews were conducted in English. All discussions were audio-recorded and transcribed. In order to minimize the possibility of a socially desirable response set, the follow-up assessment and structured interview was not administered by the peer counsellor who delivered the intervention. Participants were given a grocery store voucher valued at ZAR 30 (about US\$4) for completing the baseline interview, after each intervention session, and after completing the final assessment.

Outcome Measures

The primary outcome measure for this study was substance use involvement and secondary outcomes included problem-solving styles and depression symptomatology. These measures are described below:

Substance use involvement. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST: WHO ASSIST Working Group, 2002) was used to measure involvement in substance use. The ASSIST was originally developed to detect and manage substance use in primary and general medical care settings. Scores on the ASSIST are used to group people into low, moderate or high risk categories for substance-related problems. Low risk indicates that the participant is at low risk for health and other problems from their current pattern of substance use (with scores of 0–10 for alcohol and 0–3 for illicit drugs). Moderate risk indicates that the person is at risk for health and other problems from their current pattern of substance use; with scores of 11–26 for alcohol and 4–26 for illicit drugs. Scores >26 indicate that the participant is at high risk of experiencing severe problems as a result of their

current pattern of use and is likely to be dependent. Although, the psychometric properties of the ASSIST have not been validated in South Africa, evidence from other LMICs such as Brazil revealed adequate reliability (Cronbach's alpha of 0.80 to alcohol, 0.79 to cannabis and 0.81 to cocaine) (Henrique, De, Lacerda, Lacerda, & Formigoni, 2004).

Problem solving. The Social Problem-Solving Inventory-Revised, Short Form (SPSI-R:SF; D'Zurilla et al., 2002) was used to measure adaptive and maladaptive approaches to problem solving. The SPSI-R:SF is a 25-item self-report questionnaire, with five subscales that assess functional and dysfunctional cognitive and emotional orientations towards solving life problems. The subscales are Positive Problem Orientation (PPO; five items, e.g., "Whenever I have a problem, I believe it can be solved."), Negative Problem Orientation (NPO; five items, e.g., "When my first efforts to solve a problem fail, I get very frustrated."), Rational Problem-Solving (RPS; five items; e.g., "When I have a problem to solve, one of the things I do is analyse the situation and try to identify what obstacles are keeping me from getting what I want."), Impulsivity-Carelessness Style (ICS; five items, e.g., "When I am attempting to solve a problem, I act on the first idea that occurs to me."), and Avoidant Style (AS; 5 items, e.g., "I prefer to avoid thinking about the problems in my life instead of trying to solve them."). Higher scores on the NPO, ICS, and AS reflect a more maladaptive approach to problem solving; whereas higher scores on the PPO and RPS indicate more adaptive problem solving (D'Zurilla et al., 2002).

Depression. The Center for Epidemiological Studies Depression scale (CES-D; Radloff, 1977) was used to measure the extent of depressive symptomatology. The CES-D is designed to measure common symptoms of depression in the general population and consists of 20 self-rated items. Each item is rated on a four-point Likert scale, ranging from 0 (indicating no symptom presence) to 3 (indicating symptoms most or all of the time). Composite scale scores range from 0 to 60, with a score of 16 or higher signifying clinically meaningful depression (Radloff, 1977). Among different populations, the CES-D has shown acceptable psychometric properties, with the standard cut-off score of 16 yielding sensitivity estimates ranging between 84% and 100% and specificity estimates ranging from 69% to 90% (Naughton & Wiklund, 1993).

Data Analysis

Quantitative data were analyzed using SPSS Version 20.0. Frequency distributions and descriptive statistics (mean, medians) were calculated for categorical and continuous variables. We used paired sample *t*-tests to assess initial effect of the intervention on the primary and secondary outcome variables. Statistical significance was based on 2-sided tests and set at $\alpha = 0.07$ in order to adjust for number of secondary outcomes.

The qualitative data analysis for this study was conducted using the framework approach (familiarization, identifying a thematic framework, indexing, charting, mapping and interpretation; Pope, Ziebland, & Mays, 2000). Initially, interview responses were read for emergent themes, which were then coded. To establish inter-coder reliability, each transcript was coded by two individuals who met to compare notes and establish a degree of agreement and resolve coding differences. Cohen's Kappa was used to measure inter-coder agreement. Coding discrepancies were discussed and resolved until the Cohen's Kappa score reached 80% agreement. We used NVivo 9.0, a qualitative software programme for data analysis.

Results

Characteristics of the Sample

Most participants were male ($n = 11$; 55%) with an average age of 31 years ($SD = 11$). Most were single ($n = 14$; 70%), unemployed ($n = 12$; 60%) and did not complete high school ($n = 12$; 60%). Seven (35%) of these patients presented themselves to the emergency department as a result of a violent assault, and 11 (55%) reported that they were under the influence of substances when they presented at the emergency services. Nineteen of the 20 participants (95%) reported alcohol as their primary substance of abuse and one (5%) reported problems associated with cannabis use in addition to alcohol (Table I). Of the 20 participants who enrolled in the study, 15 (75%) completed all sessions and their three-month follow-up (3 mfu) assessment. There were no differences in baseline characteristics between those who attended all appointments and those who did not complete the study.

Primary and Secondary Outcomes

MI-PST was associated with significant reductions in ASSIST scores at the three-month follow-up [$t(14) = 6.66$, $p < 0.001$]. The mean ASSIST score at follow-up was 6.67 ($SD = 6.8$) and the mean ASSIST change score from baseline was -14.13 .

Table I. Demographic characteristics of sample.

	N	%
Age (m, SD)	31	11
Sex		
Male	11	55
Female	9	45
Race		
Black African	13	65
Coloured	7	35
Marital status		
Single	14	70
Married	6	30
Education		
Did not finish high school	12	60
Finished high school	8	40
Employment		
Yes	8	40
No	12	60
Intent of injury		
Intentional	7	35
Self-inflicted	1	5
Road accident	1	5
Other	11	55
Under the influence when injured		
Alcohol	10	50
Marijuana	1	5
Total substance use involvement score (m, SD)	19.25	6.2

Table II. Outcome measures for 15 participants.

	Mean	SD	<i>t</i> -value	<i>P</i> -value
<i>Primary outcome</i>				
Total substance use involvement score (ASSIST)				
Baseline	20.8	6.8	6.66	<i>p</i> < 0.001
Follow-up	6.7	5.8		
<i>Secondary outcomes</i>				
CES-D (depression)				
Baseline	18.64	10	1.36	0.197
Follow-up	13.64	9.36		
<i>SPSI-R: SF-social problem solving</i>				
Positive problem solving orientation				
Baseline	2.27	0.85	−1.71	0.11
Follow-up	2.78	0.62		
Negative problem solving orientation				
Baseline	1.3	0.92	−0.25	0.81
Follow-up	1.37	0.84		
Rational problem coping style				
Baseline	2.07	0.88	−3.39	<i>p</i> < 0.001
Follow-up	2.79	0.44		
Impulsive/careless coping style				
Baseline	1.15	0.68	2.17	0.005
Follow-up	0.66	0.56		
Avoidant coping style				
Baseline	1.2	0.58	1.60	0.133
Follow-up	0.84	0.76		

MI-PST was also associated with notable gains on the Rational Problem-Solving scale [RPS; $t(14) = -3.39$, $p < 0.001$] and reductions in the Impulsive or Careless Style scale [ICS; $t(14) = 1.17$, $p < 0.001$]. There were no differences in symptoms of depression, problem-solving orientation (either negative or positive), or Avoidant Style of Coping (AS; Table II).

Preliminary Responses to the MI-PST Programme

Fourteen respondents (93%) conveyed that the programme helped them better understand their level of risk for substance use, and that it provided them with valuable information concerning what they could do about their substance use. Thirteen of the 15 respondents (87%) reported that the programme helped them cut down or stop using substances and helped them deal with their problems in a more appropriate and rational manner. Four of the 15 respondents (27%) reported difficulties in accessing funds to pay for the transportation required to attend their sessions, while 14 of the 15 (93%) felt that they would have liked to attend more sessions with the counsellors.

Attitudes towards Screening. All of the participants ($n = 15$) felt that the screening tool that the counsellor used to assess substance use risk was easy to understand, short in duration and provided

valuable insight into their current patterns of substance use. They reported that the tool helped them understand the level of risk associated with their current pattern of substance use and that the educational information provided during the structured feedback helped them understand the positive and negatives of using substances. This was encapsulated by the following statement:

The questions made me think about my alcohol use and all the things that have happened to me because I drink. I thought that because I don't drink any more than my friends that I don't have a problem. My score showed high risk. I couldn't believe it.

Feedback on the intervention. Almost all participants ($n = 13$, 87%) noted that the intervention sessions assisted them to change their behaviour and ultimately reduce their substance use. Prior to the intervention, about a third ($n = 6$, 33%) of the participants were unaware of the negative effects associated with their substance use. The intervention seemed to provide them with insight into the consequences of substance use as a way of coping with problems, as reflected in the following comment:

The more you drink the more you ignore the problems. Instead of facing the problems I kept running to the alcohol. But now, I feel like a new person because I am facing the problem head on.

Several respondents enjoyed the opportunity to think about the problems that were affecting their lives and categorizing these problems according to degree of importance (an aspect of PST). They were surprised by how many things they originally considered as significant were categorized as "unimportant" when they were examined more closely. As one respondent recounted:

I use to get so upset about small things that really don't matter that much. I would often think that I was bad at my job and that other people were always going to be better. I realise now that this is not the case. The counsellor told me what I can do to try to stop these thoughts. I think they are working.

Although all respondents appreciated the opportunity to spend time with the counsellor and discuss their problems, two respondents felt that the programme in its present form did not assist them in reducing their substance use, nor did it make any significant changes in their life. As one participant noted:

It didn't help me much. It just made me aware of the situation I am in, but it didn't help me solve the situation. Maybe it's more for educated people who understand.

When asked about how the MI-PST programme could be improved, it was clear that most of the respondents would have liked the option of attending more sessions with the counsellor ($n = 14$, 93%) and/or have had access to a support group where they could have the opportunity to meet other community members who are also struggling with substance-related problems ($n = 6$, 40%).

Feedback on PST booklets and homework sessions. Most respondents described the PST booklet as easy to understand and that it provided a useful space to keep detailed notes on progress ($n = 13$, 87%). They felt that the booklet supplemented the information provided by the counsellor and clarified any issues that were unclear during the sessions. Although a few respondents struggled with some of the terminology used in the English version of the booklet ($n = 3$, 20%), they were provided with a version in their home language to provide clarity. As one respondent stated:

The steps of PST were quite easy and straightforward, especially when I read the booklet on my own. I could then understand it even more and gave some practice tips. I only used the English. It was fine. The isiXhosa version was going to be way too complicated.

Most respondents ($n = 13$, 88%) reported that they had no problems keeping up with the homework and completing the exercises in the booklet. For example, a participant stated:

I enjoyed the homework. It was fun and easy. I didn't feel stressed at all. In fact, thinking about problems was almost easier on my own after I met with the counsellor.

The respondents ($n = 3$, 20%) who did not find the booklet helpful also struggled with the homework component of the intervention. They felt that the focus on the booklet took time that could have been spent talking with the counsellor ($n = 1$, 7%) or the language used when describing problems-solving techniques was too difficult to understand ($n = 2$, 13%). Two of these respondents also reported low literacy levels which impacted on their ability to follow the advice provided in the patient hand-out and complete the homework. These concerns are reflected through the following comment:

The homework exercises were very hard because I was on my own. I did struggle to understand what I had to do and I had to ask my counsellor at the start of the session every week to go over what I was supposed to do for homework, [be]cause I didn't understand. My family members were not supportive. The only person I had was the counsellor.

Perceptions of counsellors delivering the intervention. When asked about their perceptions of the counsellors that delivered the intervention, most respondents reported that they appeared knowledgeable about substance use, ($n = 15$, 100%), were easy to talk to ($n = 14$, 93%), and provided a safe, supportive environment where personal problems could be freely discussed ($n = 14$, 93%). These perceptions are illustrated through the following comment:

She is very professional, she helped me to understand the problem, and she is not a difficult person to engage with. She is very understanding and she really knows how to care about people. I could tell her everything.

Although a few respondents expressed that it was initially difficult to disclose personal issues to strangers ($n = 4$, 27%), by the end of the programme this was no longer a concern. This was expressed by one participant who said:

My first session was difficult [be]cause I was talking to someone that I didn't know. But as time went on I started to believe in her and then felt comfortable sharing my problems. She was a stranger, but now

we talk like she is someone I have known for a long time.

Discussion

This study is among the first to examine the acceptability and preliminary outcomes of a blended MI-PST intervention for substance use disorders. More specifically, findings indicate that when delivered correctly by counsellors this task shiftable intervention has high levels of acceptability and utility, and may result in significant improvements to substance use and problem-solving skills among patients with risky patterns of substance use.

To begin with, our findings suggest that a blended MI-PST intervention may be effectively delivered by peer counsellors located within emergency room departments. We found that with intensive training and on-going supervision and support, peer counsellors were able to screen patients for risky substance use and deliver a blended MI-PST intervention with fidelity to patients with risky patterns of substance use attending emergency room services in Cape Town, South Africa.

This intervention lends itself to a task-shifting approach as it follows clearly defined steps that are simple to teach to non-professional staff, easy to manualize, and therefore, easy to monitor for fidelity to the intervention. Our finding that the use of peer counsellors was highly acceptable to recipients of the intervention further supports the appropriateness of assigning this intervention to non-speciality personnel. These findings support emerging evidence, which indicates that lay counsellors or non-speciality health personnel can be trained to deliver brief psychosocial interventions (Patel et al., 2011), including PST (Chibanda et al., 2011; van't Hof et al., 2011) for mental disorders with positive outcomes. This is important, as task-shifting responsibility for the delivery of these interventions to non-speciality personnel will in all likelihood improve the feasibility of implementing these interventions in LMICs as it circumvents one of the major barriers to the implementation of psychosocial interventions in these settings, namely the shortages of health professionals (Kakuma et al., 2011).

Second, our findings demonstrate that a blended MI-PST intervention to reduce substance use has high levels of acceptability and utility to patients with risky patterns of substance use attending emergency services in Cape Town, South Africa. Most participants reported that the screening process and MI-PST intervention was useful as it helped them understand the risks associated with their substance use, provided valuable insight into the effects that

their substance use had on their lives, provided them with the necessary skills to deal with difficult problems, and helped them reduce their substance use. Our findings that three-quarters of participants who consented to participate in the intervention completed all four intervention sessions, and that the majority of participants expressed a desire for additional intervention sessions, provide further evidence of the acceptability and perceived utility of this intervention. This finding is encouraging, as previous studies have also reported that this intervention programme is also highly acceptable to health care providers when implemented using a task-shifting framework.

Third, findings from this small pilot study suggest that a blended MI-PST intervention holds promise for improving problem-solving skills and reducing substance use among people who are largely poorly educated and unemployed. Following our intervention, participants reported significant reductions in impulsive or careless approaches to problem solving; a problem-solving style which has been associated with substance use (Elliot et al., 1997; Jaffee & D'Zurilla, 2009). In addition, this study provides preliminary evidence of significant reductions in substance use involvement following the intervention, with participants on average moving from moderate risk use to low risk use. To the best of our knowledge, this study is among the first to demonstrate the positive effects of a blended MI-PST on substance use outcomes, and as such is a significant contribution to the literature on interventions for problematic substance use. However, as this was an uncontrolled pilot study, these findings remain preliminary and the effectiveness of this intervention for reducing substance use needs to be confirmed in a future randomized controlled trial. Although we did not find significant reductions in depressive symptomatology following the intervention, mean scores on the CES-D did decrease subsequent to the intervention. It is quite likely that the small sample size of this pilot did not have sufficient power to detect changes on this measure, especially given previous literature which has supported the effectiveness of PST for addressing depression (Cuijpers et al., 2007).

While our findings provide preliminary evidence that a blended MI-PST intervention holds promise for facilitating changes in substance use, we learned some valuable lessons that need to be considered when scaling up this intervention. First, more effort needs to be taken to ensure that low literacy populations can understand and benefit from the PST booklet and the homework sessions. To improve the accessibility of this intervention for low literacy populations, future studies should consider

using audiotapes, smartphone applications or speaking books to package the intervention booklets and support materials (Mackert, Kahlor, Tyler, & Gustafson, 2009). Many participants also would have liked the opportunity to return for further counseling sessions or to be linked with a support group that could help them maintain their reduced substance use and improved problem-solving skills. Testing the delivery of an MI-PST intervention in a group format or delivering MI-PST in an individual format and linking participants to peer support groups as part of the intervention programme may provide potential solutions to these concerns.

The main limitations of this study include its small sample size and uncontrolled design. Given the lack of a comparison group, the role of chance and non-specific treatment factors (such as time and counselor-patient therapeutic alliance), cannot be ruled out as potential mechanisms for changes in substance use. Improvements in substance use outcomes may also have been a result of placebo effects. Related to this, we were unable to explore whether this blended MI-PST intervention was any more effective than MI alone. Secondly, our small sample size limited our power to detect change in depression and other variables over time. In addition, as we had a small sample of participants who mainly reported alcohol as their substance of choice, this study yields very limited information on MI-PST as a treatment for illicit drug use. Additionally, although fidelity to the intervention by the counsellors was an integral component of this project, we did not use a structured fidelity checklist during the implementation of this intervention. Therefore, the results of the present study should be interpreted with caution, pending replication in a larger randomized controlled trial that examines the relative effectiveness of MI-PST to MI alone.

In conclusion and despite some limitations, results from this small pilot study suggest that a blended MI-PST intervention is an acceptable and effective short-term treatment for addressing risky patterns of substance use within a LMIC context when the delivery of PST is task-shifted to peer counsellors. This study is among the first to provide evidence of the potential effectiveness of an MI-PST intervention for reducing problematic substance use. These promising outcomes suggest that larger randomized controlled trials are warranted to further evaluate the efficacy and cost-effectiveness of this intervention prior to scaling up its implementation in South Africa and other LMIC settings.

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